

## Appendix E

### Conversion Factors and Foreign Units of Measure

Multiply:	By:	To obtain:
<b>A</b>		
acres	0.02471	ares
acres	43,560	square feet
acres	4,047	square meters
acres	$1.562 \times 10^{-3}$	square miles
acres	5645.38	square varas
acres	4,840	square yards
acres	100	square meters
acre-feet	43,560	cubic feet
atmospheres	76.0	centimeters of mercury
atmospheres	29.92	inches of mercury
atmospheres	33.9	feet of water
atmospheres	10,333	kilograms per square meter
atmospheres	14.7	pounds per square inch
atmospheres	1.058	tons per square foot
<b>B</b>		
bars	$9.870 \times 10^{-7}$	atmospheres
bars	1	dynes per square centimeter
bars	0.01020	kilograms per square meter
bars	$2.089 \times 10^{-3}$	pounds per square foot
bars	$1.450 \times 10^{-5}$	pounds per square inch
board-feet	144 square inches x 1 inch	cubic inches
British thermal units	0.2520	kilogram-calories
British thermal units	777.5	foot-pounds

Multiply:	By:	To obtain:
British thermal units	$3.927 \times 10^{-4}$	horsepower-hours
British thermal units	1.054	joules
British thermal units	107.5	kilogram-meters
British thermal units	$2.928 \times 10^{-4}$	kilowatt-hours
British thermal units per minute	12.96	foot-pounds per second
British thermal units per minute	0.02356	horsepower
British thermal units per minute	0.01757	kilowatts
British thermal units per minute	17.57	watts
British thermal units per square foot per minute	0.1220	watts per square inch
bushels	1.244	cubic feet
bushels	2,150	cubic inches
bushels	0.03524	cubic meters
bushels	4	pecks
bushels	64	pints (dry)
bushels	32	quarts (dry)

**C**

centares	1	square meters
centigrams	0.01	grams
centiliters	0.01	liters
centimeters	0.3937	inches
centimeters	0.01	meters
centimeters	393.7	mils
centimeters	$10^{-5}$	millimeters
centimeters-dynes	$7.233 \times 10^{-5}$	centimeter-grams
centimeters-dynes	$1.020 \times 10^{-8}$	meter-kilograms
centimeter-dynes	$7.376 \times 10^{-8}$	pound-feet
centimeter-grams	980.7	centimeter-dynes
centimeter-grams	$10^{-3}$	meter-kilograms

Multiply:	By:	To obtain:
centimeter-grams	$7.233 \times 10^{-3}$	pound-feet
centimeters of mercury	0.01316	atmospheres
centimeters of mercury	0.4461	feet of water
centimeters of mercury	136.0	kilograms per square meter
centimeters of mercury	27.85	pounds per square foot
centimeters of mercury	0.1934	pounds per square inch
centimeters per second	1.969	feet per minute
centimeters per second	0.03281	feet per second
centimeters per second	0.036	kilometers per hour
centimeters per second	0.6	meters per minute
centimeters per second	0.02237	miles per hour
centimeters per second	$3.728 \times 10^{-4}$	miles per minute
centimeters per second per second	0.03281	feet per second per second
centimeters per second per second	0.036	kilometers per hour per second
centimeters per second per second	0.02237	miles per hour per second
circular mils	$5.067 \times 10^{-6}$	square centimeters
circular mils	$7.854 \times 10^{-7}$	square inches
circular mils	0.7854	square mils
cord-feet	4 foot x 4 foot x 1 foot	cubic feet
cords	8 foot x 4 foot x 4 foot	cubic feet
cubic centimeters	$3.531 \times 10^{-5}$	cubic feet
cubic centimeters	$6.102 \times 10^{-2}$	cubic inches
cubic centimeters	$10^{-6}$	cubic meters
cubic centimeters	$1.308 \times 0^{-6}$	cubic yards
cubic centimeters	$2.642 \times 10^{-4}$	gallons
cubic centimeters	$10^{-3}$	liters
cubic centimeters	$2.113 \times 10^{-3}$	pints (liquid)
cubic centimeters	$1.057 \times 10^{-3}$	quarts (liquid)

Multiply:	By:	To obtain:
cubic feet	$2.832 \times 10^4$	cubic centimeters
cubic feet	1,728	cubic inches
cubic feet	0.02832	cubic meters
cubic feet	0.03704	cubic yards
cubic feet	7.481	gallons
cubic feet	28.38	liters
cubic feet	59.84	pints (liquid)
cubic feet	29.92	quarts (liquid)
cubic feet per minute	472.0	cubic centimeters per second
cubic feet per minute	0.1247	gallons per second
cubic feet per minute	0.7420	liters per second
cubic feet per minute	62.4	pounds of water per minute
cubic inches	16.39	cubic centimeters
cubic inches	$5.787 \times 10^{-4}$	cubic feet
cubic inches	$1.639 \times 10^{-5}$	cubic meters
cubic inches	$2.143 \times 10^{-5}$	cubic yards
cubic inches	$4.329 \times 10^{-3}$	gallons
cubic inches	$1.639 \times 10^{-2}$	liters
cubic inches	0.03463	pints (liquid)
cubic inches	0.01732	quarts (liquid)
cubic meters	$10^6$	cubic centimeters
cubic meters	35.31	cubic feet
cubic meters	61,023	cubic inches
cubic meters	1.308	cubic yards
cubic meters	264.2	gallons
cubic meters	$10^3$	liters
cubic meters	2113	pints (liquid)
cubic meters	1057	quarts (liquid)
cubic yards	$7.646 \times 10^5$	cubic centimeters

Multiply:	By:	To obtain:
cubic yards	27	cubic feet
cubic yards	46,656	cubic inches
cubic yards	0.7646	cubic meters
cubic yards	202.0	gallons
cubic yards	764.6	liters
cubic yards	1616	pints (liquid)
cubic yards	807.9	quarts (liquid)
cubic yards per minute	0.45	cubic feet per second
cubic yards per minute	3.367	gallons per second
cubic yards per minute	12.74	liters per second

**D**

days	24	hours
days	1440	minutes
days	86,400	seconds
decigrams	0.1	grams
deciliters	0.1	liters
decimeters	0.1	meters
degrees (angle)	60	minutes
degrees (angle)	0.01745	radians
degrees (angle)	3600	seconds
degrees per second	0.01745	radians per second
degrees per second	0.1667	revolutions per minute
degrees per second	0.002778	revolutions per second
dekagrams	10	grams
dekaliters	10	liters
dekameters	10	meters
drams	1.772	grams
drams	0.0625	ounces
dynes	$1.020 \times 10^{-3}$	grams

Multiply:	By:	To obtain:
dynes	$7.233 \times 10^{-5}$	poundals
dynes	$2.248 \times 10^{-6}$	pounds
dynes per square centimeter	1	bars
<b>E</b>		
ergs	$9.486 \times 10^{-11}$	British thermal units
ergs	1	dyne-centimeters
ergs	$7.376 \times 10^{-8}$	foot-pounds
ergs	$1.020 \times 10^{-3}$	gram-centimeters
ergs	$10^{-7}$	joules
ergs	$2.390 \times 10^{-11}$	kilogram-calories
ergs	$1.020 \times 10^{-8}$	kilogram-meters
ergs per second	$5.692 \times 10^{-9}$	British thermal units per minute
ergs per second	$4.426 \times 10^{-6}$	foot-pounds per minute
ergs per second	$7.376 \times 10^{-8}$	foot-pounds per second
ergs per second	$1.341 \times 10^{-10}$	horsepower
ergs per second	$1.434 \times 10^{-9}$	kilogram-calories per minute
ergs per second	$10^{-10}$	kilowatts
<b>F</b>		
fathoms	6	feet
feet	30.48	centimeters
feet	12	inches
feet	0.3048	meters
feet	36	varas
feet	1/3	yards
feet of water	0.02950	atmospheres
feet of water	0.8826	inches of mercury
feet of water	304.8	kilograms per square meter
feet of water	62.43	pounds per square foot

Multiply:	By:	To obtain:
feet of water	0.4335	pounds per square inch
feet per minute	0.5080	centimeters per second
feet per minute	0.01667	feet per second
feet per minute	0.01829	kilometers per hour
feet per minute	0.3048	meters per minute
feet per minute	0.01136	miles per hour
feet per second	30.48	centimeters per second
feet per second	1.097	kilometers per hour
feet per second	0.5921	knots per hour
feet per second	18.29	meters per minute
feet per second	0.6818	miles per hour
feet per second	0.01136	miles per minute
feet per 100 feet	1	percent grade
feet per second per second	30.48	centimeters per second per second
feet per second per second	1.097	kilometers per hour per second
feet per second per second	0.3048	meters per second per second
feet per second per second	0.6818	miles per hour per second
foot-pounds	$1.268 \times 10^{-3}$	British thermal units
foot-pounds	$1.356 \times 10^7$	ergs
foot-pounds	$5.050 \times 10^{-7}$	horsepower-hours
foot-pounds	1.356	joules
foot-pounds	$3.241 \times 10^{-4}$	kilogram-calories
foot-pounds	0.1383	kilogram-meters
foot-pounds	$3.766 \times 10^{-7}$	kilowatt-hours
foot-pounds per minute	$1.286 \times 10^{-3}$	British thermal units per minute
foot-pounds per minute	0.01667	foot-pounds per second
foot-pounds per minute	$3.030 \times 10^{-5}$	horsepower

Multiply:	By:	To obtain:
foot-pounds per minute	$3.241 \times 10^{-4}$	kilogram-calories per minute
foot-pounds per minute	$2.260 \times 10^{-5}$	kilowatts
foot-pounds per second	$7.717 \times 10^{-2}$	British thermal units per minute
foot-pounds per second	$1.818 \times 10^{-3}$	horsepower
foot-pounds per second	$1.945 \times 10^{-2}$	kilogram-calories per minute
foot-pounds per second	$1.356 \times 10^{-3}$	kilowatts
furlongs	40	rods

**G**

gallons	3,785	cubic centimeters
gallons	0.1337	cubic feet
gallons	231	cubic inches
gallons	$3.785 \times 10^{-3}$	cubic meters
gallons	$4.851 \times 10^{-3}$	cubic yards
gallons	3.785	liters
gallons	8	pints (liquid)
gallons	4	quarts (liquid)
gallons per minute	$2.228 \times 10^{-3}$	cubic feet per second
gallons per minute	0.06308	liters per second
gills	0.1183	liters
gills	0.25	pints (liquid)
grains (troy)	1	grains (average)
grains (troy)	0.06480	grams
grains (troy)	0.04167	pennyweights (troy)
grams	980.7	dynes
grams	15.43	grains (troy)
grams	$10^{-3}$	kilograms
grams	$10^3$	milligrams
grams	0.03527	ounces

Multiply:	By:	To obtain:
grams	0.03215	ounces (troy)
grams	0.07093	poundals
grams	$2.205 \times 10^{-3}$	pounds
gram-calories	$3.968 \times 10^{-3}$	British thermal units
gram-centimeters	$9.302 \times 10^{-3}$	British thermal units
gram-centimeters	980.7	ergs
gram-centimeters	$7.233 \times 10^{-3}$	foot-pounds
gram-centimeters	$9.807 \times 10^{-5}$	joules
gram-centimeters	$2.344 \times 10^{-8}$	kilogram-calories
gram-centimeters	$10^{-5}$	kilogram-meters
grams per centimeter	$5.6 \times 10^{-3}$	pounds per inch
grams per cubic centimeter	62.43	pounds per cubic foot
grams per cubic centimeter	0.3613	pounds per cubic inch
grams per cubic centimeter	$3.405 \times 10^{-7}$	pounds per mil-foot

**H**

hectares	2.471	acres
hectares	$1.076 \times 10^5$	square feet
hectograms	100	grams
hectoliters	100	liters
hectometers	100	meters
hectowatts	100	watts
hemispheres (solid angle)	0.5	sphere
hemispheres (solid angle)	4	spherical right angles
hemispheres (solid angle)	6.283	steradians
horsepower	42.44	British thermal units per minute
horsepower	33,000	foot-pounds per minute
horsepower	550	foot-pounds per second
horsepower	1.014	horsepower (metric)

Multiply:	By:	To obtain:
horsepower	10.70	kilogram-calories per minute
horsepower	0.7457	kilowatts
horsepower	745.7	watts
horsepower (boiler)	33,520	British thermal units per hour
horsepower (boiler)	9.804	kilowatts
horsepower-hours	2,547	British thermal units
horsepower-hours	$1.98 \times 10^6$	foot-pounds
horsepower-hours	$2.684 \times 10^6$	joules
horsepower-hours	641.7	kilogram-calories
horsepower-hours	$2.737 \times 10^5$	kilogram-meters
horsepower-hours	0.7457	kilowatt-hours
hours	60	minutes
hours	3,600	seconds

**I**

inches	2.540	centimeters
inches	$10^3$	mils
inches	0.03	varas
inches of mercury	0.03342	atmospheres
inches of mercury	1.133	feet of water
inches of mercury	345.3	kilograms per square meter
inches of mercury	70.73	pounds per square foot
inches of mercury	0.4912	pounds per square inch
inches of water	0.002458	atmospheres
inches of water	0.07355	inches of mercury
inches of water	25.40	kilograms per square meter
inches of water	0.5781	ounces per square inch
inches of water	5.204	pounds per square foot
inches of water	0.03613	pounds per square inch

Multiply:	By:	To obtain:
<b>J</b>		
joules	$9.486 \times 10^{-4}$	British thermal units
joules	$10^7$	ergs
joules	0.7376	foot-pounds
joules	$2.390 \times 10^{-4}$	kilogram-calories
joules	0.1020	kilogram-meters
joules	$2.778 \times 10^{-4}$	watt-hours
<b>K</b>		
kilograms	980,665	dynes
kilograms	$10^3$	grams
kilograms	70.93	poundals
kilograms	2.2046	pounds
kilograms	$1.102 \times 10^{-3}$	tons (short)
kilogram-calories	3.968	British thermal units
kilogram-calories	3,088	foot-pounds
kilogram-calories	$1.588 \times 10^{-3}$	horsepower-hours
kilogram-calories	4,183	joules
kilogram-calories	426.6	kilogram-meters
kilogram-calories	$1.162 \times 10^{-3}$	kilowatt-hours
kilogram-calories per minute	51.43	foot-pounds per second
kilogram-calories per minute	0.09351	horsepower
kilogram-calories per minute	0.06972	kilowatts
kilogram-centimeters squared	$2.373 \times 10^{-3}$	pounds-feet squared
kilogram-centimeters squared	0.3417	pounds-inches squared
kilogram-meters	$9.302 \times 10^{-3}$	British thermal units
kilogram-meters	$9.807 \times 10^7$	ergs
kilogram-meters	7.233	foot-pounds
kilogram-meters	9.807	joules
kilogram-meters	$2.344 \times 10^{-3}$	kilogram-calories

Multiply:	By:	To obtain:
kilogram-meters	$2.742 \times 10^{-6}$	kilowatt-hours
kilograms per cubic meter	$10^{-3}$	grams per cubic centimeter
kilograms per cubic meter	0.06243	pounds per cubic foot
kilograms per cubic meter	$3.613 \times 10^{-5}$	pounds per cubic inch
kilograms per cubic meter	$3.405 \times 10^{-10}$	pounds per mil foot
kilograms per meter	0.6720	pounds per foot
kilograms per square meter	$9.678 \times 10^{-5}$	atmospheres
kilograms per square meter	98.07	bars
kilograms per square meter	$3.281 \times 10^{-3}$	feet of water
kilograms per square meter	$2.896 \times 10^{-3}$	inches of mercury
kilograms per square meter	0.2048	pounds per square foot
kilograms per square meter	$1.422 \times 10^{-3}$	pounds per square inch
kilograms per square millimeter	$10^6$	kilograms per square meter
kiloglines	$10^3$	maxwells
kiloliters	$10^3$	liters
kilometers	$10^5$	centimeters
kilometers	3281	feet
kilometers	$10^3$	meters
kilometers	0.6214	miles
kilometers	1093.6	yards
kilometers per hour	27.78	centimeters per second
kilometers per hour	54.68	feet per minute
kilometers per hour	0.9113	feet per second
kilometers per hour	0.5369	knots per hour
kilometers per hour	16.67	meters per minute
kilometers per hour	0.6214	miles per hour
kilometers per hour per second	27.78	centimeters per second per second
kilometers per hour per second	0.9113	feet per second per second

Multiply:	By:	To obtain:
kilometers per hour per second	0.2778	meters per second per second
kilometers per hour per second	0.6214	miles per hour per second
kilometers per minute	60	kilometers per hour
kilowatts	56.92	British thermal units per minute
kilowatts	$4.425 \times 10^4$	foot-pounds per minute
kilowatts	737.6	foot-pounds per second
kilowatts	1.341	horsepower
kilowatts	14.34	kilogram-calories per minute
kilowatts	$10^3$	watts
kilowatt-hours	3415	British thermal units
kilowatt-hours	$2.655 \times 10^6$	foot-pounds
kilowatt-hours	1.341	horsepower-hours
kilowatt-hours	$3.6 \times 10^6$	joules
kilowatt-hours	860.5	kilogram-calories
kilowatt-hours	$3.671 \times 10^5$	kilogram-meters
knots	51.48	centimeters per second
knots	1.689	feet per second
knots	1.853	kilometers per hour
knots	1.152	miles per hour

**L**

links (engineer's)	12	inches
links (surveyor's)	7.92	inches
liters	$10^3$	cubic centimeters
liters	0.03531	cubic feet
liters	61.02	cubic inches
liters	$10^{-3}$	cubic meters
liters	$1.308 \times 10^{-3}$	cubic yards
liters	0.2642	gallons

Multiply:	By:	To obtain:
liters	2.113	pints (liquid)
liters	1.057	quarts (liquid)
liters per minute	$5.885 \times 10^{-4}$	cubic feet per second
liters per minute	$4.403 \times 10^{-3}$	gallons per second
$\log_{10}N$	2.303	$\log_E N$ or $\ln N$
$\log_E N$ or $\ln N$	0.4343	$\log_{10}N$
lumens per square foot	1	foot-candles
<b>M</b>		
meters	100	centimeters
meters	3.2808	feet
meters	39.37	inches
meters	$10^{-3}$	kilometers
meters	$10^3$	millimeters
meter-kilograms	$9.807 \times 10^7$	centimeter-dynes
meter-kilograms	$10^5$	centimeter-grams
meter-kilograms	7.233	pound-feet
meters per minute	1.667	centimeters per second
meters per minute	3.281	feet per minute
meters per minute	0.05468	feet per second
meters per minute	0.06	kilometers per hour
meters per minute	0.03728	miles per hour
meters per second	196.8	feet per minute
meters per second	3.281	feet per second
meters per second	3.6	kilometers per hour
meters per second	0.06	kilometers per minute
meters per second	2.237	miles per hour
meters per second	0.3728	miles per minute
meters per second per second	3.281	feet per second per second

Multiply:	By:	To obtain:
meters per second per second	3.6	kilometers per hour per second
meters per second per second	2.237	miles per hour per second
microns	$10^{-6}$	meters
miles	$1.609 \times 10^5$	centimeters
miles	5,280	feet
miles	1.6093	kilometers
miles	1,760	yards
miles	1900.8	varas
miles per hour	44.70	centimeters per second
miles per hour	88	feet per minute
miles per hour	1.467	feet per second
miles per hour	1.6093	kilometers per hour
miles per hour	0.8690	knots per hour
miles per hour	26.82	meters per minute
miles per hour per second	44.70	centimeters per second per second
miles per hour per second	1.467	feet per second per second
miles per hour per second	1.6093	kilometers per hour per second
miles per hour per second	0.4470	meters per second per second
miles per minute	2682	centimeters per second
miles per minute	88	feet per second
miles per minute	1.6093	kilometers per minute
miles per minute	0.8684	knots per minute
miles per minute	60	miles per hour
milliers	$10^3$	kilograms
milligrams	$10^{-3}$	grams
milliliters	$10^{-3}$	liters
millimeters	0.1	centimeters

Multiply:	By:	To obtain:
millimeters	0.03937	inches
millimeters	39.37	mils
mils	0.002540	centimeters
mils	$10^{-3}$	inches
miner's inches	1.5	cubic feet per minute
minutes (angle)	$2.909 \times 10^{-4}$	radians
minutes (angle)	60	seconds (angle)
months	20.42	days
months	730	hours
months	43,800	minutes
months	$2.628 \times 10^6$	seconds
myriagrams	10	kilograms
myriameters	10	kilometers
myriawatts	10	kilowatts
<b>N</b>		
nautical miles	6067	feet
nautical miles	1.852	kilometers
nautical miles	1.151	miles
nautical miles	2025	yards
<b>O</b>		
ounces	8	drams
ounces	437.5	grains
ounces	28.35	grams
ounces	0.0625	pounds
ounces (fluid)	1.805	cubic inches
ounces (fluid)	0.02957	liters
ounces (troy)	480	grains (troy)
ounces (troy)	31.10	grams
ounces (troy)	20	pennyweights (troy)

Multiply:	By:	To obtain:
ounces (troy)	0.08333	pounds (troy)
ounces per square inch	0.0625	pounds per square inch
<b>P</b>		
pennyweights (troy)	24	grains (troy)
pennyweights (troy)	1.555	grams
pennyweights (troy)	0.05	ounces (troy)
perches (masonry)	24.75	cubic feet
pints (dry)	33.60	cubic inches
pints (liquid)	28.87	cubic inches
poundals	13,826	dynes
poundals	14.10	grams
poundals	0.03108	pounds
pounds	444,823	dynes
pounds	7,000	grains
pounds	453.6	grams
pounds	16	ounces
pounds	32.17	poundals
pounds (troy)	0.8229	centimeter-dynes
pound-feet	$1.356 \times 10^7$	centimeter-grams
pound-feet	13,825	meter-kilograms
pound-feet	0.1383	meter-kilograms
pound-feet squared	421.3	kilograms-centimeters squared
pounds-feet squared	144	pounds-inches squared
pounds-inches squared	2.926	kilograms-centimeters squared
pounds-inches squared	$6.945 \times 10^{-3}$	pounds-feet squared
pounds of water	0.01602	cubic feet
pounds of water	27.68	cubic inches
pounds of water	0.1198	gallons

Multiply:	By:	To obtain:
pounds of water per minute	$2.669 \times 10^{-4}$	cubic feet per second
pounds per cubic foot	0.01602	grams per cubic centimeter
pounds per cubic foot	16.02	kilograms per cubic meter
pounds per cubic foot	$5.787 \times 10^{-4}$	pounds per cubic inch
pounds per cubic foot	$5.456 \times 10^{-9}$	pounds per mil foot
pounds per cubic inch	27.68	pounds per cubic centimeter
pounds per cubic inch	$2.768 \times 10^4$	kilograms per cubic meter
pounds per cubic inch	1728	pounds per cubic foot
pounds per cubic inch	$9.425 \times 10^{-6}$	pounds per mil foot
pounds per foot	1.488	kilograms per meter
pounds per inch	178.6	grams per centimeter
pounds per mil foot	$2.306 \times 10^8$	grams per cubic centimeter
pounds per square foot	0.01602	feet of water
pounds per square foot	4.882	kilograms per square meter
pounds per square foot	$6.944 \times 10^{-3}$	pounds per square inch
pounds per square inch	0.06804	atmospheres
pounds per square inch	2.307	feet of water
pounds per square inch	2.036	inches of mercury
pounds per square inch	703.1	kilograms per square meter
pounds per square inch	144	pounds per square foot

**Q**

quadrants (angle)	90	degrees
quadrants (angle)	5400	minutes
quadrants (angle)	1.571	radians
quarts (dry)	67.20	cubic inches
quarts (liquid)	57.75	cubic inches
quintals	100	pounds
quires	25	Sheets

Multiply:	By:	To obtain:
<b>R</b>		
radians	57.30	degrees
radians	3438	minutes
radians	0.637	quadrants
radians per second	57.30	degrees per second
radians per second	0.1592	revolutions per second
radians per second	9.549	revolutions per minute
radians per second per second	573.0	revolutions per minute per minute
radians per second per second	9.549	revolutions per minute per second
radians per second per second	0.1592	revolutions per second per second
reams	500	sheets
revolutions	360	degrees
revolutions	4	quadrants
revolutions	6.283	radians
revolutions per minute	6	degrees per second
revolutions per minute	0.1047	radians per second
revolutions per minute	0.01667	revolutions per second
revolutions per minute per minute	$1.745 \times 10^{-3}$	radians per second per second
revolutions per minute per minute	0.01667	revolutions per minute per second
revolutions per minute per minute	$2.778 \times 10^{-4}$	revolutions per second per second
revolutions per second	360	degrees per second
revolutions per second	6.283	radians per second
revolutions per second	60	revolutions per minute
revolutions per second per second	6.283	radians per second per second
revolutions per second per second	3600	revolutions per minute per minute

Multiply:	By:	To obtain:
revolutions per second per second	60	revolutions per minute per second
rods	16.5	feet
	<b>S</b>	
seconds (angle)	$4.848 \times 10^{-5}$	radians
spheres (solid angle)	12.57	steradians
spherical right angles	0.25	hemispheres
spherical right angles	0.125	spheres
spherical right angles	1.571	steradians
square centimeters	$1.973 \times 10^5$	circular mils
square centimeters	$1.076 \times 10^{-3}$	square feet
square centimeters	0.1550	square inches
square centimeters	$10^{-6}$	square meters
square centimeters	100	square millimeters
square feet	$2.296 \times 10^{-5}$	acres
square feet	929.0	square centimeters
square feet	144	square inches
square feet	0.09290	square meters
square feet	$3.587 \times 10^{-8}$	square miles
square feet	0.1296	square varas
square feet	1/9	square yards
square feet-feet squared	$2.074 \times 10^4$	square inches-inches squared
square inches	$1.273 \times 10^6$	circular mils
square inches	6.452	square centimeters
square inches	$6.994 \times 10^{-3}$	square feet
square inches	$10^6$	square mils
square inches	645.2	square millimeters
square inches-inches squared	41.62	square centimeters-centimeters squared
square inches-inches squared	$4.823 \times 10^{-5}$	square feet-feet squared

Multiply:	By:	To obtain:
square kilometers	247.1	acres
square kilometers	$10.76 \times 10^6$	square feet
square kilometers	$10^6$	square meters
square kilometers	0.3861	square miles
square kilometers	$1.196 \times 10^6$	square yards
square meters	$2.471 \times 10^{-4}$	acres
square meters	10.764	square feet
square meters	$3.861 \times 10^{-7}$	square miles
square meters	1.196	square yards
square miles	640	acres
square miles	$27.88 \times 10^6$	square feet
square miles	2.590	square kilometers
square miles	$3.098 \times 10^6$	square yards
square millimeters	$1.973 \times 10^3$	circular mils
square millimeters	0.01	square centimeters
square millimeters	$1.550 \times 10^{-3}$	square inches
square mils	1.273	circular mils
square mils	$6.452 \times 10^{-6}$	square centimeters
square mils	$10^{-6}$	square inches
square varas	0.0001771	acres
square varas	7.716049	square feet
square varas	0.0000002765	square miles
square varas	0.857339	square yards
square yards	$2.066 \times 10^{-4}$	acres
square yards	9	square feet
square yards	0.8361	square meters
square yards	$3.228 \times 10^{-7}$	square miles
square yards	1.1664	square varas
steradians	0.1592	hemispheres

Multiply:	By:	To obtain:
steradians	0.07958	spheres
steradians	0.6366	spherical right angles
steres	$10^3$	liters
<b>T</b>		
temperature (degrees centigrade) + 273	1	absolute temperature (degrees centigrade)
temperature (degrees centigrade) + 17.8	1.8	temperature (degrees Fahrenheit)
temperature (degrees Fahrenheit) + 460	1	absolute temperature (degrees Fahrenheit)
temperature (degrees Fahrenheit) - 32	$5/9$	temperature (degrees centigrade)
tons (long)	1016	kilograms
tons (long)	2240	pounds
tons (metric)	$10^3$	kilograms
tons (metric)	2205	pounds
tons (short)	907.2	kilograms
tons (short)	2000	pounds
tons (short) per square foot	9765	kilograms per square meter
tons (short) per square foot	13.89	pounds per square inch
tons (short) per square foot	$1.406 \times 10^6$	kilograms per square meter
tons (short) per square foot	2000	pounds per square inch
<b>V</b>		
varas	2.7777	feet
varas	33.3333	inches
varas	0.000526	miles
varas	0.9259	yards
<b>W</b>		
watts	0.05692	British thermal units per minute
watts	$10^7$	ergs per second

Multiply:	By:	To obtain:
watts	44.26	foot-pounds per minute
watts	0.7376	foot-pounds per second
watts	$1.341 \times 10^{-3}$	horsepower
watts	0.01434	kilogram-calories per minute
watts	$10^2$	kilowatts
watt-hours	3.415	British thermal units
watt-hours	2655	foot-pounds
watt-hours	$1.341 \times 10^{-3}$	horsepower-hours
watt-hours	0.8605	kilogram-calories
watt-hours	367.1	kilogram-meters
watt-hours	$10^{-2}$	kilowatt-hours
webers	$10^8$	maxwells
weeks	168	hours
weeks	10,080	minutes
weeks	604,800	seconds
<b>Y</b>		
yards	91.44	centimeters
yards	3	feet
yards	36	inches
yards	0.9144	meters
yards	1.08	varas
years (common)	365	days
years (common)	8760	hours
years (leap)	366	days
years (leap)	8784	hours

## FOREIGN UNITS OF MEASURES

Denominations:	Where used:	American equivalents:
<b>A</b>		
almude	Portugal	4.422 gallons
ardeb	Egypt	5.6188 bushels
are	metric	0.02471 acres
arr't'l or li'ra	Portugal	1.0119 pounds
arroba	Argentine Republic	25.32 pounds
arroba	Brazil	32.38 pounds
arroba	Cuba	25.36 pounds
arroba	Paraguay	25.32 pounds
arroba	Venezuela	25.40 pounds
arroba (liquid)	Cuba, Spain, Venezuela	4.263 gallons
arshine	Russia	.28 inches
arshine ( <i>squared</i> )	Russia	5.44 feet squared
artel	Morocco	1.12 pounds
<b>B</b>		
baril	Argentine Republic	20.077 gallons
baril	Mexico	20.0787 gallons
barrel	Malta (customs)	11.2 gallons
berkovets	Russia	361.128 pounds
bongkal	Federal Malay States	832 grains
bouw	Sumatra	7,096.5 meters squared
bu	Japan	0.12 inches
bushel	British Empire	1.03205 U.S. bushels
<b>C</b>		
caffiso	Malta	5.40 gallons
candy	India (Bombay)	569 pounds

<b>Denominations:</b>	<b>Where used:</b>	<b>American equivalents:</b>
candy	India (Madras)	500 pounds
cantar	Egypt	99.05 pounds
cantar	Morocco	112 pounds
cantar	Turkey	124.45 pounds
cantaro	Malta	175 pounds
cast (metric)	metric	3.086 grains
catty	China	1.333-1/3 pounds
catty	Japan	1.32 pounds
catty	Java, Malacca	1.36 pounds
catty	Thailand	2-2/3 pounds
catty (stand)	Thailand	1.32 pounds
catty	Sumatra	2.12 pounds
centaro	Central America	4.2631 gallons
centner	Brunswick	117.5 pounds
centner	Bremen	127.5 pounds
centner	Denmark, Norway	110.23 pounds
centner	Prussia	113.44 pounds
centner	Sweden	93.7 pounds
centner	double or metric	220.46
chetvert	Russia	5.957 bushels
ch'ih	China	12.6 inches
chi'ih (metric)	China	1 meter
cho	Japan	2.451 acres
comb	England	4.1282 bushels
coyan	Thailand	2,645.5 pounds
cuadra	Argentine Republic	4.2 acres
cuadra	Paraguay	94.7 yards
cuadra (square)	Paraguay	1.85 acres
cuadra	Uruguay	1.82 acres

<b>Denominations:</b>	<b>Where used:</b>	<b>American equivalents:</b>
cubic meter	metric	35.3 cubic feet
cwt (hundred weight)	British Empire	112 pounds
	<b>D</b>	
dessiatine	Russia	2.6997 acres
drachma (new)	Greece	15.43 gr., or 1 gram
	<b>F</b>	
fanega (dry)	Ecuador, Salvador	1.5745 bushels
fanega	Chile	2.75268 bushels
fanega	Guatemala, Spain	1.53 bushels
fanega	Mexico	2.57716 bushels
fanega (double)	Uruguay	7.776 bushels
fanega (single)	Uruguay	3.888 bushels
fanega	Venezuela	3.334 bushels
fanega (liquid)	Spain	16 gallons
feddan	Egypt	1.04 acres
frall (rais's)	Spain	50 pounds
frasco	Argentine Republic	2.5098 quarts (liquid)
frasco	Mexico	2.5 quarts (liquid)
frasila	Zanzibar	35 pounds
fuder	Luxembourg	264.18 gallons
funt	Russia	0.9028 pounds
	<b>G</b>	
gallon	British Empire	1.20094 U.S. gallons
garnice	Poland	1.0567 gallons
gram	metric	15.432 grains
	<b>H</b>	
hectare	metric	2.471 acres
hectolitre (dry)	metric	2.838 bushels
hectolitre (liquid)	metric	26.418 gallons

<b>Denominations:</b>	<b>Where used:</b>	<b>American equivalents:</b>
<b>J</b>		
jarib	Iran	2.471 acres
joch	Austria (Germany)	1.422 acres
joch	Hungary	1.067 acres
<b>K</b>		
<i>ken</i>	Japan	5.97 feet
<i>kilogram (kilo)</i>	metric	2.2046 pounds
<i>kilometre</i>	metric	0.62137 miles
<i>klafter</i>	Austria (Germany)	2.074 yards
<i>koku</i>	Japan	5.119 bushels
<i>kwamme</i>	Japan	8.2673 pounds
<b>L</b>		
<i>last</i>	Belgium (Netherlands)	85.134 bushels
<i>last</i>	England	82.56 bushels
<i>last</i>	Germany	2 metric tons (4,409 + pounds)
<i>last</i>	Prussia	112.29 bushels
<i>last</i>	Scotland, Ireland	82.564 bushels
<i>league (land)</i>	Paraguay	4.633 acres
<i>li</i>	China	1,890 feet
libra (pound)	Argentine Republic	1.0128 pounds
libra	Central America	1.014 pounds
libra	Chile	1.014 pounds
libra	Cuba	1.0143 pounds
libra	Mexico	1.01467 pounds
libra	Peru	1.0143 pounds
libra	Uruguay	1.0143 pounds
libra	Venezuela	1.0143 pounds
litre	metric	1.0567 quarts (liquid)
litre	metric	0.90810 quarts (dry)

<b>Denominations:</b>	<b>Where used:</b>	<b>American equivalents:</b>
livre (pound)	Greece	1.1 pounds
livre	Guiana (Dutch)	(NEED INFORMATION)
load, timber	England	50 cubic feet
lumber, standard	Europe	165 cubic feet, or 1,980 feet b.m.
<b>M</b>		
manzana	Nicaragua	1.742 acres
manzana	Costa Rica, Salvador	1.727 acres
marc	Bolivia	0.507 pounds
maund	India	82-2/7 pounds
metre	metric	39.37 inches
mil	Denmark	4.68 miles
mil (geographic)	Denmark	4.61 miles
milla	Nicaragua	1.1594 miles
milla	Honduras	1.1493 miles
mina (old)	Greece	2.202 pounds
morgen	Germany	0.63 acres
<b>O</b>		
oke	Egypt	2.8052 pounds
oke (ocque)	Greece	2.82 pounds
oke	Turkey	2.828 pounds
<b>P</b>		
pic	Egypt	22.82 inches
picul	Borneo, Celebes	135.64 pounds
picul	China	133-1/3 pounds
picul	Java	136.16 pounds
picul	Philippine Republic	139.44 pounds
pie	Argentine Republic	0.94708 feet
pie	Spain	0.91416 feet

<b>Denominations:</b>	<b>Where used:</b>	<b>American equivalents:</b>
pik	Turkey	27.9 inches
pood	Russia	36.113 pounds
pund (pound)	Denmark	1.102 pounds
<b>Q</b>		
quart	British Empire	1.20094 quarts (liquid)
quart	British Empire	1.03205 quarts (dry)
quarter	Great Britain	8.256 bushels
quintal	Argentine Republic	101.28 pounds
quintal	Brazil	120.54 pounds
quintal	Castle, Peru	101.43 pounds
quintal	Chile	101.41 pounds
quintal	Mexico	101.47 pounds
quintal	metric	220.46 pounds
<b>R</b>		
rottle	Israel	6.35 pounds
<b>S</b>		
sack (flour)	England	280 pounds
sangene	Russia	7 feet
salm	Malta	8.2 bushels
se	Japan	0.02451 acres
seer	India	22 - 35 pounds
shaku	Japan	11.9303 inches
sho	Japan	1.91 quarts (liquid)
skalpund	Sweden	0.937 pounds
stone	British Empire	14 pounds
sun	Japan	1.193 inches
<b>T</b>		
tael kuping	China	575.64 grains (troy)
tan	Japan	2.05 pecks

<b>Denominations:</b>	<b>Where used:</b>	<b>American equivalents:</b>
tchvtert	Russia	5.96 bushels
to	Japan	2.05 pecks
ton	space measure	40 cubic feet
tonde cereals	Denmark	3.9480 bushels
tonda land	Denmark	1.36 acres
tonne	France	2204.62 pounds
tsubo	Japan	35.58 feet squared
tsun	China	1.26 inches
tunna (wheat)	Sweden	4.5 bushels
tunnland	Sweden	1.22 acres
<b>V</b>		
vara	Argentine Republic	34.0944 inches
vara	Costa Rica, Salvador	32.913 inches
vara	Guatemala	32.909 inches
vara	Honduras	32.593 inches
vara	Nicaragua	33.057 inches
vara	Chile and Peru	32.913 inches
vara	Cuba	33.386 inches
vara	Mexico	32.992 inches
vedro	Russia	2.707 gallons
verst	Russia	0.663 miles
vloka	Poland	41.50 acres
<b>W</b>		
wey	Scotland and Ireland	41.282 bushels